EMINENT TUTORIALS Class-x	MATHEMATICS PAPER	PAPER NO. 2

Join test series of MATHS & SCIENCE at EMINENT TUTORIALS @ 100/Test **Add. Opp. Deep Palace, Rania**

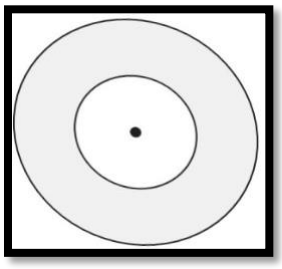
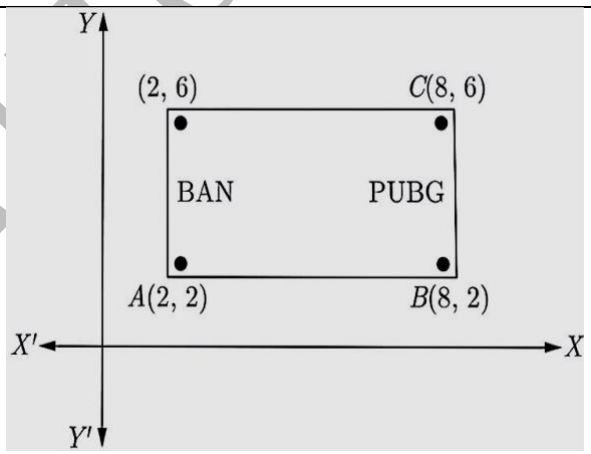
Time : 3 Hours **Maximum Marks : 80**

General Instructions :

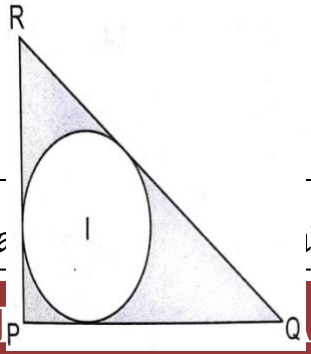
(i) All questions are compulsory.
(ii) The questions paper consists of 40 questions divided into four sections A, B, C and D.
(iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv) There is no overall choice. However, an internal choices have been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted.

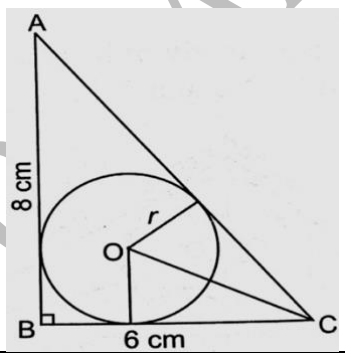
Sr. No.	QUESTIONS	Marks
	SECTION-A **Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options.**	
1.	Ratio of lateral surface areas of two cylinders with equal height is (a) 1:2 (b) H:h (c) R:r (d) None	1
2.	(i) The L.C.M. of x and 18 is 36. (ii) The H.C.F. of x and 18 is 2. What is the number x ? (a) 1 (b) 2 (c) *3* (d) *4*	1
3.	In a number of two digits, unit's digit is twice the tens digit. If 36 be added to the number, the digits are reversed. The number is, (a) 36 (b) 63 (c) 48 (d) 84	1

4.	The length of altitude of an equilateral triangle of side 8 cm is: (a) $2\sqrt{3}$ (b) $3\sqrt{3}$ (c) $4\sqrt{3}$ (d)$5\sqrt{3}$	**1**
5.	*C* is the mid-point of *PQ*, if *P* is (4, *x*), *C* is (*y*,− 1) and *Q* is (− 2, 4), then *x* and *y* respectively are (a)-6 and 1 *(b) -6 and 2* (c)6 and -1 *(d) 6 and -2*	**1**
6.	If tan2*A* = cot(*A* – 18°), where 2*A* is an acute angle, then the value of *A* is (a) 12° *(b)* 18° (c) 36° *(d)*48°	**1**
7.	The value of x, for which the polynomials $x^2 - 1$ *and* $x^2 - 2x + 1$ vanish simultaneously is: (a) 2 *(b) -2* (c) 1 *(d) -1*	**1**
8.	If the equation $(m^2 + n^2)x^2 - 2(mp + np)x + p^2 + q^2 = 0$ has equal roots, then: *(a)mp=nq* *(b) mq=np* (c) mn=pq *(d) mq=*$\sqrt{pq}$	**1**
9.	How many cube each of side 2 cm can be put a cube of side 6 cm. *(a)3* *(b) 9* (c) 27 *(d) 81*	**1**
10.	If the less than ogive and more than ogive of a data intersect at (25,36), the median and total frequency of the data is: (a)25 and 72 *(b) 52 and 72* (c) 25 and 27 *(d)52 and 27*	**1**
11.	If *p* is a prime number and it divides a^2 then it also divides ....., where *a* is a positive integer.	**1**
12.	The highest power of a variable in a polynomial is called its	**1**
13.	Someone is asked to make a number from 1 to 100. The probability that it is a prime is	**1**
14.	If the pair of equations $2x + 3y = 11$ *and* $(m + n)x + (2m - n)y = 33$ has infinitely many solution then m=..... and n=.....	**1**
15.	Two dice are thrown at random .What is the probability of getting the sum of numbers obtained as 9?	**1**
16.	If the heights of two cylinders are equal and their radii are in the ratio of 7 : 5, then the ratio of their volumes is	**1**

17.	Two coins of diameter 2 cm and 4 cm respectively are kept one over the other as shown in the figure, find the area of the shaded ring shaped region in square cm .		**1**
18.	Find median of the data, using an empirical relation when it is given that Mode = 12.4 and Mean = 10.5.		**1**
19.	The distance of a point P (-3,-4) from the x-axis is:		**1**
20.	If the sum of first n even naturals numbers is 420. Then the value of n is:		**1**
	SECTION-B		
21.	Read the following passage and answer the questions that follows: One tends to become lazy. Also, starting at your mobile screen for long hours can affect you eyesight and give you headaches. Those who are addicted to playing PUBG can get easily stressed out or face anxiety issues in public due to lack of social interaction. To raise social awareness about ill effects of playing PUBG, a school decided to start "BAN PUBG: campaign, students are asked to prepare campaign board in the shape of rectangle (as shown in the figure). (i) Find the area of the board. (ii) It cost of 1 cm^2 of board is `8, then find the cost of board.		**2**
22.	There are 30 cards of the same size in a bag in which the numbers 1 to 30 are written. One card is taken out of the bag at random. Find the probability that the number on the selected card is not divisible by 3. **OR** A coin is tossed 3 times. find the probability of getting:		**2**

	(i) At least one tail (ii) not getting the same result in all the tosses (iii) Exactly 1 tail	
23.	Find the number of natural numbers between 101 and 999 which are divisible by 2 and 5.	**2**
24.	Prove that the point (3,0), (6,4) and (−1, 3) are the vertices of a right angled isosceles triangle. **OR** Find the relation between x and y , if the point $A(x, y), B(-5,7)$ and $C(-4,5)$ are collinear.	**2**
25.	If the pair of equations $x\ \sin\theta + y\cos\theta = 1\ and\ x + y = \sqrt{2}$ has an infinitely many solutions, then what is value of θ.	**2**
26.	If the HCF of 65 and 117 is in the form of (65m-117), then find the value of m.	**2**
	SECTION-C	
27.	Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1^{st} and 4^{th}) to the product of means (2^{nd} and 3^{rd}) is 5:6.	**3**
28.	Find the value of a and b so that $x^4+x^3 + 8x^2 + ax + b\ is\ divisible\ by\ x^2 + 1$.	**3**
29.	Evaluate: $\frac{2}{3}cosec^2 58° - \frac{2}{3}cot58°\ tan32° - \frac{5}{3}tan13°\ tan37°\ tan45°\ tan53°\ tan77°$ **OR** Prove that: $\frac{Cos^3\theta+Sin^3\theta}{Cos\theta+Sin\theta} + \frac{Cos^3\theta-Sin^3\theta}{Cos\theta-Sin\theta} = 2$	**3**
30.	Draw a circle of radius 3 cm. Take a point P on it. Without using the centre of the circle, draw a tangent to the circle at point P. **OR** Construct a triangle similar to a given equilateral ΔPQR with side 5cm such that each of its side is $\frac{6}{7}$ of the corresponding sides of ΔPQR.	**3**
31.	In the given figure, PQR is right angle triangle at P. Find the area of shaded region , if PR=4 cm, RQ=5 cm and I is the centre of incircle of $\Delta\ PQR$.	**3**



32.	A ladder 15m long reaches a window which is 9m above the ground on one side of a street .Keeping its foot at the same point ,the ladder is turned to the other side of the street to reach window 12m high .find the width of the street. **OR**		**3**
	In the given figure, a right angle triangle ABC, circumscribes a circle of radius r. If AB and BC are length of 8cm and 6cm respectively, find the value of r.		
33.	One card is drawn from a pack of 52 cards. Find the probability of getting (i)Non-face card (ii) Black king or Red queen (iii) Spade card.		**3**
34.	Solve for x and y: $\frac{3a}{x}-\frac{2b}{y}+5=0$, $\frac{a}{x}+\frac{3b}{y}-2=0$		**3**
	SECTION-D		
35.	BL and CM are medians of a triangle ABC right angle at A. Prove that $4(BL^2+CM^2)=5BC^2$ **OR** The ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides.		**4**

36. One-fourth of a herd of camels was seen in the forest. Twice the square root of the herd gone to mountains and the remaining 15 camels were seen on the bank of river. Find the total number of camels. **4**

OR

Solve for x: $\frac{x-4}{x-5}+\frac{x-6}{x-7}=\frac{10}{3}$; $x \neq 5,7$

37. A metallic right circular cone 20cm high and whose vertical angle is 60° is cut into two equal parts at the middle of its height by a plane parallel to its base . If the frustum so obtained be drawn into a wire of diameter $\frac{1}{16}cm$, find the length of the wire . **4**

38. The angle of elevation of an airplane from a point on the ground is 60°. After a flight of 30 seconds the angle of elevation becomes 30°.If the airplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of airplane.

39. If mode of the following data is 32.5 and the sum of frequencies is 71, then find the missing frequencies x *and* y. **4**

Class interval	25-29	30-34	35-39	40-44	45-49	50-54	55-59
Freq.	x	22	y	8	7	3	2

OR

Find the missing frequencies f_1, f_2 *and* f_3 in the following distribution ,when it is given that $f_2 : f_3 = 4:3$, and mean is 50.

Class int.	0-20	20-40	40-60	60-80	80-100	Total
Freq.	17	f_1	f_2	f_3	19	120

40. Prove that: $\frac{(2\,Cos^2\theta-1)^2}{Cos^4\theta-Sin^4\theta}=1-2\,Sin^2\theta.$ **4**

OR

Prove that: $\frac{1}{Secx-tanx}-\frac{1}{cosx}=\frac{1}{cosx}-\frac{1}{secx+tanx}$

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